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REPORT OF PRELIMINARY SITE ASSESSMENT

TARGET STATION #940

4945 York Boulevard
Highland Park, California 90042

Submitted to:

City of Los Angeles
Department of Fire
Underground Tank Unit
200 North Main Street
Los Angeles, CA 90012

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INTRODUCTION

This report presents the results of a preliminary subsurface soil investigation to assess the release of petroleum hydrocarbons from underground fuel storage tanks, product transfer lines, and dispensers at the subject site.

The scope of this investigation included: 1) the drilling and sampling of twelve soil borings to a maximum depth of approximately twenty-one feet; 2) chemical analysis of soil samples from each boring; 3) a limited evaluation of site geologic and hydrogeologic conditions; 4) assessment of impacts to the soil and ground water from product releases, 5) preliminary recommendations for further site assessment and remedial action, and; 6) preparation of a report of findings.

Site Description

The subject site is a retail vehicle fueling facility, located at the intersection of York Boulevard and Avenue 50, in the city of Highland Park, California. The Vicinity Map, Figure 1, shows the site and nearby geographic features. A group of four underground fuel storage tanks, of various capacities, are located on the southeastern part of the site, adjacent to Avenue 50. These include two 5,000 gallon capacity tanks; one storing premium-grade gasoline and the other diesel. The other two tanks, of 8,000 gallon capacity, contain gasoline. A single waste oil tank is located on the south side of the sales office/garage building. The tank locations are shown on the Site Plan, Figure 2. Two dispenser islands are located along the north and east sides of the site, adjacent to York Boulevard and Avenue 50, respectively.

GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

A limited discussion of the general geologic and hydrogeologic conditions beneath the site is provided here as a background for assessment of the potential impacts of released underground storage tank product on ground water resources.

The site is located in a lowland area within a series of low hills between the San Rafael and Repetto Hills, which are situated at the northern edge of the Los Angeles basin.
It is located on Quaternary age valley-fill sediments derived from the sedimentary formations underlying the adjacent hills. A fault strand associated with the Raymond Hill Fault Zone, passes beneath the site. This northwest-trending normal fault strand

reportedly offsets the sedimentary units that underlie the hills immediately to the north and south of the site. Published geologic maps of the site area indicate the alluvium underlying the site comprises a thin veneer of material underlain by nonmarine conglomerate and sandstone.

A review of Los Angeles County Hydrologic Records indicates there is only one ground water monitoring well within the site vicinity. County well No. 3987H, located approximately 2,000 feet west of the site, last indicated a depth to ground water (May 1992) of approximately 3 feet. Information developed from wells located on the subject site (detailed below), reportedly originally intended as vapor extraction wells, indicate that the site-specific depth to ground water is approximately 7-8 feet below ground surface.

FIELD INVESTIGATION

A total of twelve (12) solid-stem auger soil borings were drilled in the underground storage tank areas and dispenser islands, on March 28-30, 1992. Boring locations are shown on the Site Plan, Figure 2. The general location and pattern of borings was designated by Niedenfuer & Associates. Boring depths varied from approximately twelve to twenty-one feet.

Drilling And Sampling Protocols

The auger borings were drilled using four-inch outside diameter (O.D.) solid-stem auger drilling equipment. Soil samples were generally retained at five foot intervals for analytical testing, using a two-inch diameter (I.D.) split-spoon sampler attached to drill rods and an automatic drive-sampler. The solid-stem augers were removed prior to sample acquisition. Soils encountered in the borings were classified in accordance with the Unified Soil Classification System (USCS). Boring Logs are presented in Appendix A for review.

All solid-stem augers were steam cleaned prior to use, and all sampling equipment was detergent washed and clean water rinsed between samples. Soil samples were collected by driving a Modified California Sampler approximately 18 inches below the bottom of the drilled hole. Six-inch brass liner tubes were used to collect relatively undisturbed soil samples. The lower six-inch liner tube was used for laboratory analyses, and the upper six-inch tube used for description.

Samples utilized for chemical analyses were capped with foil and plastic end caps immediately after removal from the sampler, taped, labeled, and stored on ice until delivery to the laboratory under chain-of-custody. Sample labeling included the project name, discrete sample and boring number, depth, and date.

All soil cuttings were deposited in drums for appropriate disposition after sample analysis. Upon completion, each boring was abandoned using Baroid Holeplug bentonite. The bentonite completely filled each boring to within approximately six inches of the ground surface. The remaining hole was filled to grade with concrete.

Field screening of the soils for petroleum hydrocarbons was conducted utilizing a HNu PI-101 Photoionization Detector. Results of the field hydrocarbon concentrations are included in the Boring Logs.

Health and Safety

The investigation was conducted in accordance with a general Health and Safety Plan prepared for petroleum hydrocarbon sites. The conditions encountered during the investigation did not require the use of respiratory or other personal protection, and there were no health, or safety related incidents.

Investigation of Existing On-site Wells

Several existing on-site wells were investigated, to develop information on the site-specific ground water conditions. These 4-inch diameter wells are reported to have been originally constructed as vapor extraction wells, but are currently not operable. Specific well construction information was not made available to the undersigned. The information developed from measurements of the wells is summarized in Table 1, and the well locations are shown on the Site Plan, Figure 2. The well data indicates that ground water varies from about 7-8 feet below ground surface. Free product hydrocarbons were also measured in the two wells nearest the tank bed.

SUBSURFACE CHARACTERISTICS

The soils encountered to the total depth explored in the subsurface borings were predominantly clay-sand mixtures (SC) with some sandy clays (CL) and silty sands (SM) noted.

Ground water was encountered in several borings in the tank bed area, and in the existing wells located on the site. Ground water is approximately 7-8 feet below the ground surface.

Free petroleum hydrocarbon product was also observed in two of the existing wells, in the vicinity of the tank bed. Apparent free product was also noted in the borings at both the north and south ends of the eastern dispenser island; however, wells near the north end of the island did not indicate free product. The maximum measured free product thickness was 14 inches, in a well located at the north end of the tank bed.

ANALYTICAL PROGRAM

Soil sample analyses were performed by Centrum Analytical Laboratories, a DHS certified environmental testing laboratory, located in Redlands, California.

The soil samples from boring B-1 were analyzed for Total Petroleum Hydrocarbons (TPH), by EPA Method 418.1. Soil samples obtained from the borings B-2, and B-4 through B-12, were analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline, by EPA Method 8015-Modified. Samples from borings B-3, B-4, and B-6 through B-8 were analyzed for diesel, by EPA Method 8015-Modified.

All soil samples were anlyzed for: 1) the aromatic volatiles, benzene, toluene, xylenes, and ethylbenzene (BTX&E) by EPA Method 8020, and; 2) total organic lead by the DOHS method.

ANALYTICAL RESULTS

The analytical results of the soil samples, with the exception of organic lead analysis, have been summarized in Table 2. All analyses for organic lead were non-detected, so their summarization was not included in the Table.

The data indicate the presence of elevated concentrations of hydrocarbons and aromatic volatiles in all borings. The concentration of TPH in the boring adjacent to the waste oil tank was highest at a depth of ten feet, at 4600 mg/Kg. The lowermost sample, at a depth of fifteen feet, was non-detected.

The concentrations of gasoline in the borings varied from non-detected, up to a maximum of 3100 mg/Kg in boring B-7 at a depth of seven feet. The highest concentrations in the borings in the tank bed area were generally found in the upper ten feet (borings B-2 and B-4 through B-6). In each case for these borings, the lowermost soil samples, at a depth of twenty feet, were non-detected. With the exception of boring B-2, the fifteen foot deep samples were also non-detected. In that boring, the fifteen foot deep sample had a gasoline concentration of 1.3 mg/Kg.

The gasoline concentrations were generally similar in the borings located near the dispenser islands, and along piping runs (borings B-7 through B-12). The highest gasoline concentrations were found between seven and twelve feet deep. The lowermost samples from all but one of these borings (which varied from twelve to seventeen feet), were all approximately 1 mg/Kg. Boring B-8 indicated a gasoline concentration in the lowermost sample, at a depth of twelve feet, of 1600 mg/Kg.

The diesel concentrations in the borings in the tank bed area (borings B-3, B-4, and B-6), generally followed the pattern of gasoline, with the highest concentrations in the upper ten feet. With the exception of boring B-4, the fifteen and twenty foot samples were all non-detected for diesel. In boring B-4, the diesel concentration in the fifteen foot sample was 190 mg/Kg; and the twenty foot sample was non-detected.

Aromatic volatiles, BTX&E, were detected in all borings, with concentration distributions similar to TPH. Benzene varied in concentration from non-detected, up to a maximum of 18 mg/Kg. Toluene concentrations also varied from non-detected, up to a maximum of 160 mg/Kg. Total xylenes varied up to a maximum of 380 mg/Kg, and ethylbenzene varied up to a maximum of 66 mg/Kg. The maximum concentration for each of these compounds was detected in boring B-7, at a depth of seven feet.

Organic lead was not detected in any of the soil samples from the borings.

The actual laboratory report is presented in Appendix B, for review of specific sample results.

CONCLUSIONS

The following conclusions incorporate Los Angeles City Fire Department, Underground Tank Unit, action levels for petroleum products and associated aromatic compounds in soils. These levels are 100 mg/Kg for gasoline and/or diesel, 1 mg/Kg benzene, and 50 mg/Kg for toluene, xylenes, and ethylbenzene.

Underground Tanks

Based on the observations made during this preliminary investigation, it is concluded there has been a significant release of stored product from the underground tanks, resulting in the development of a free-product layer of hydrocarbons around the existing tank bed. Observations from the wells located in the vicinity of the tank bed indicate a product thickness of as much as fourteen inches in that area.

The lateral limits of the product release have not been defined by this preliminary investigation. The vertical limits of migration of the hydrocarbons has been generally defined in the tank bed area. The analytical results indicate that the hydrocarbons are essentially limited to less than fifteen feet in depth. All but one of the samples from depths of fifteen and twenty feet were non-detected. The single detection was in a fifteen foot sample, at 1.6 mg/Kg, in boring B-2. Vertical product migration has been limited by the shallow ground water.

The analytical results for TPH, from the boring adjacent to the waste oil tank, appear to indicate a release. However, the presence of diesel from the nearby fuel tank may be what has been detected, since the EPA Method 418.1 TPH analysis non-specifically quantifies all hydrocarbons in the diesel and heavier hydrocarbon range.

Dispenser Islands

The analytical results from the borings located at the ends of the dispenser islands indicate significant releases of gasoline and aromatic compounds to the soil in these areas. Diesel was not detected in any of these borings, so it is concluded there has been no release of this product in this area.

All of the borings adjacent to the dispenser islands had elevated concentrations of gasoline and aromatic compounds. Although no lateral limits of migration can be determined from the data, the vertical limits have generally been defined. The vertical migration appears to be limited to the top fifteen feet, as it is in the tank area. The lowermost samples (twelve foot depth) in all but boring B-8, were below the Fire Department action level. The twelve foot deep sample from boring B-8 had a gasoline concentration of 1600 mg/Kg.

Product Transfer Lines

The two borings, B-9 and B-10, located along the piping runs between the dispensers also indicate a significant release of gasoline and aromatic compounds. As with the tank bed and dispenser islands, the lateral limits of the release have not been defined. The vertical limits of gasoline and aromatic compound migration are generally limited to approximately the top fifteen feet of soils. The lowermost samples from the borings indicated gasoline concentrations of 1 mg/Kg, or less.

Ground Water

The observations from this investigation indicate the presence of a free-product layer of gasoline, and possibly diesel, on top of the ground water beneath the site. The installation of ground-water/product monitoring wells was not within the scope of this investigation, so no assessment can be made at this time as to the overall distribution of free product, or limits of dissolved product beneath the site.

RECOMMENDATIONS

Based on the findings from this investigation, the following actions are recommended: 1) the existing tanks and product transfer lines should be removed and replaced with systems meeting current regulatory requirements; 2) removal of free product should be initiated immediately, and 3) further site investigation should be conducted to define the distribution of released product in both soil and ground water.

If the station is to remain in service, it is recommended that the existing tanks and product lines be removed and replaced with double-wall systems, which meet current regulatory requirements. The new tanks should be located away from the known areas of product release, in order to minimize interference with remedial actions.

As an interim remedial measure, an agency-approved product recovery system should be installed in Well A, where the greatest thickness of hydrocarbons was observed. Based on the presence of relatively low-permeability soils at the site, a low flow-rate/product-only system would probably be most appropriate. Selection of a product recovery system should be preceded by testing to determine removal rates and other factors.

The lateral extent of releases to the soil and ground water, from the product storage and distribution system at the site, have not been fully defined. Therefore, further site characterization is recommended.

Additional soil borings are recommended at the following locations, to aid in defining the lateral limits of the product release: 1) near the southwest and southeast corners of the property, for lateral limits to the east and west of the tank bed areas; 2) along Avenue 50 and York Boulevard, adjacent to the associated dispenser islands, to define the easterly and northerly limits, respectively, from those source areas; 3) near the northwest property corner, to define the lateral limits to the west of the north dispenser island, and; 4) in the area between the building and the north island, to determine whether product has migrated to this area from the islands or tank beds.

It is recommended that at least three ground-water monitoring wells be installed at the site, to determine the extent of migration of dissolved product. The recommended soil borings near the property corners could be utilized for the construction of these monitoring wells. The existing Well "D" could also be used in the ground-water monitoring network, to determine flow direction and dissolved chemical distribution.

Once the extent of the releases is better defined, additional appropriate remedial actions can be evaluated.

REMARKS

The conclusions and recommendations of this report are in accordance with generally accepted professional principles and practice in the field of environmental engineering and geology. The findings presented are based on professional interpretation of the information provided to the undersigned by others during this investigation. It is not warranted that this information cannot be superseded by future geotechnical, environmental, or technological developments. No other warranty is made, either express or implied.

Chemical testing was done by a state certified environmental testing laboratory. No warranty is made as to the precision or accuracy of the resulting analytical data.

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Respectfully Submitted,

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The following are attached and complete this report:

- Table 1 - Existing Well Descriptions
- Table 2 - Summary of Analytical Results
- Figure 1 - Vicinity Map
- Figure 2 - Site Plan
- Appendix A - Boring Logs
- Appendix B - Laboratory Report, Chain-of-custody Records

Distribution:

- Los Angeles City Fire Department (3)
- California Target Enterprises (1)
- Niedenfuer & Assoc. (1)
- AAES, Inc. (1)

Table 1
Existing Well Description

Well Number (Arbitrary)	Total Depth (ft)	Depth to Water (ft)	Product Thickness (ft)
A	12.5	7.8	0.67
B	14.0	7.2	1.17
C	20.0	7.8	0
D	21.0	8.4	0
E	20.4	8.1	0
F	20.1	6.8	0

TABLE 2

Summary of Analytical Results

Sample No.	Gasoline (mg/Kg)	TPH 418.1 (mg/Kg)	Diesel (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Xylenes (ug/Kg)	Ethyl-benzene (ug/Kg)
B-1-5	-	ND	-	14	ND	13	ND
B-1-10	-	4600	-	10000	40000	120000	17000
B-1-15	-	ND	-	30	52	130	21
B-2-5	1.6	-	-	180	13	210	43
B-2-10	66	-	-	700	1100	4100	700
B-2-15	1.3	-	-	170	10	20	6
B-2-20	ND	-	-	20	8	20	ND
B-3-5	-	-	2000	600	51	3200	960
B-3-10	-	-	1000	14	11	330	63
B-3-15	-	-	ND	4	ND	ND	270
B-3-20	-	-	ND	ND	ND	9	ND
B-4-5	2900	-	1000	13000	5700	330000	45000
B-4-10	ND	-	190	1900	4700	20000	2400
B-4-15	ND	-	190	210	13	460	120
B-4-20	ND	-	ND	ND	ND	6	ND
B-5-5	ND	-	-	18	ND	ND	ND
B-5-10	2.2	-	-	1000	220	250	50
B-5-15	ND	-	-	10	ND	22	ND
B-5-20	ND	-	-	44	30	46	8
B-6-5	970	-	ND	3200	1800	42000	9100
B-6-10	1400	-	ND	16000	120000	280000	47000
B-6-15	ND	-	ND	40	23	14	ND
B-6-20	ND	-	ND	10	7	5	ND
B-7-7	3100	-	ND	18000	160000	380000	66000
B-7-12	56	-	ND	2400	5900	12000	2000
B-8-7	ND	-	ND	610	39	340	370
B-8-12	1600	-	ND	4600	14000	120000	17000
B-9-7	150	-	-	140	1600	15000	1900
B-9-12	290	-	-	3000	7400	19000	2600
B-9-15	1.0	-	-	4700	100	100	22
B-10-7	720	-	-	1200	8100	48000	7700
B-10-12	98	-	-	2400	4400	5100	900
B-10-17	0.7	-	-	460	29	28	10
B-11-7	23	-	-	190	640	4100	850
B-11-12	86	-	-	1600	5200	10000	1700
B-12-7	710	-	-	670	1500	4200	610
B-12-12	1.1	-	-	41	170	350	62